AD6464M / AD128128M

Modular AES/EBU Digital Audio Router

User manual

Rev. 7

Nevion Support

Nevion Europe

P.O. Box 1020
3204 Sandefjord, Norway
Support phone 1: +47 33 48 99 97
Support phone 2: +47 90 60 99 99

Nevion USA

1600 Emerson Avenue
Oxnard, CA 93033, USA
Toll free North America: (866) 515-0811
Outside North America: +1 (805) 247-8560

E-mail: support@nevion.com
See http://www.nevion.com/support/ for service hours for customer support globally.

Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
7	6	2011-01-26	NBS	Added pictures in Chapter 3.5.1 and 3.5.2.
6	5	2010-12-15	NBS	New template. Added Declaration of Conformity. Changed Syscon to Multicon VX-MOD.
5	4	2007-03-29	NBS	Added Materials Declaration and EFUP.
4	3	2007-02-02	TØ	Updated picture of GYDA-VX, and added DB25 connection table to section 5. Applied new document template.
3	2	2006-09-26		Updated product names and GYDA section
2	1	2006-02-09		Removed protocol and configuration details.
1	0	2005-09-28		Corrected RS-422 pinout description in Chapter 4.1.
0	-	2005-04-21		Initial Revision, based on A128M manual.

Contents

1 Product overview 4
1.1 Product versions 4
2 Specifications 5
2.1 Mechanics 5
2.2 Power Supply 5
2.3 Control 5
2.4 Audio specifications 6
2.5 Rear view 7
3 Modules inside the Modular AES/EBU Digital Audio Router 8
3.1 How to access the modules 8
3.2 How to configure the router and modules 8
3.3 Power Supply module 8
3.4 System Controller – Multicon VX-MOD 10
3.5 X-point module 13
4 Router communication 17
5 Connecting signal cables to the router 18
6 Before calling Nevion Support 19
7 Serial number overview 20
General environmental requirements for Nevion equipment 21
Product Warranty 22
Important notes regarding Software in the VikinX Modular router family range 23
Appendix A Materials declaration and recycling information 24
EC Declaration of Conformity 26

1 Product overview

The Modular AES/EBU Digital Audio Router is part of the VikinX Modular product range, offering up to 128x128 cross points. This top of the line router provides a very compact frame, fully hot-swappable architecture, built-in dual redundant power supply and fully redundant controller functions.

Starting with the size of 64x64 digital audio cross-points, the router can be expanded under operation with 64x64 increments. Advanced control features like TCP/IP interface and SNMP agent, as well as comprehensive surveillance of the router's vital parameters are possible via the well known Multicon VX-MOD.

As for our well known VikinX Sublime router series low power consumption has been important.

VikinX Modular provides a fully hot-swappable architecture, meaning that all components are front loaded without any active components on the rear panel.

VikinX Modular provides all important 3rd party control interfaces allowing the control of our routers through 3rd party management software. On top of that does the Nevion's THOR management package allow control of the most common 3rd party routers. This enables you to utilise existing routers and management systems from other manufacturers and still draw the advantages of implementing VikinX Modular in your routing application.

1.1 Product versions

The following versions of the VikinX Modular AES/EBU Digital Audio Router are available:

AES/EBU Digital Audio router - 5RU:

AD6464M	VikinX Modular router for Digital Audio, 5RU, equipped 64x64, expandable up to 128x128.
AD128128M	As above, but fully equipped 128x128.

2 Specifications

2.1 Mechanics

Dimensions:	HxWxD = 220x483x340mm, (19”, 5RU).
Backplane card:	128x128 AES/EBU Digital Audio.
X-point Modules:	64x64 AES/EBU Digital Audio module cards.
System Controller:	1 Multicon VX-MOD[1] card required; 1 redundant card is optional.

2.1.1 Emission/Immunity and Safety standards

Emission/Immunity standards:	Compliant with CE EN55103-1 and 2, FCC part 15.
Safety standards:	Compliant with CE EN60950, UL-1950/CSA22.2.

2.2 Power Supply

Built-in, redundant power supply. 1 module included, 1 (redundant) optional.

Total power consumption:	<300W.
AC Supply voltage range:	90-130VAC / 180-254VAC, switchable, 50-60Hz, 300W.
AC Mains connector:	IEC 320, separate input for each PSU module.
Alarms:	Power failure alarm on relay contact closure, LED in front, and Open Collector.
Alarms connector:	RJ45.

2.3 Control

Standard Features:

Serial ports:	RS-232/RS-422 for protocol conversion, to VikinX compact control protocol, or to third party protocols. (1x per Multicon VX-MOD card).
Connector:	DB9, female.
Ethernet ports:	10/100BaseT Ethernet bus for external router control with new protocol. (1x per Multicon VX-MOD card).
Connector:	RJ45.
Monitored parameters: (via Multicon VX-MOD)	– Module temperature. – Internal module voltages.
Status surveillance:	On each card with LED, and via system controller.
Configuration storage:	Removable compact flash card.
Synchronization[2] handled by Multicon VX-MOD:	– Analog Black Burst, Looped. Both PAL and NTSC supported. – Tri-Level, Looped. For HD signal formats only.
Connector:	BNC.

Other features:

SNMP agent, included with with Multicon VX-MOD[3].

[1] Syscon may be applied instead of Multicon VX-MOD in older installations.
[2] Synchronization of an audio router is not necessary, but an available feature for users who intend to switch this router synchronised to video, using video synchronization signals.

Optional features:

Redundant control:	Redundant Matrix Control using 2x Multicon VX-MOD.

2.4 Audio specifications

Electrical signal inputs:

Type:	Transformer balanced.
Connector:	DB25 female.
Impedance:	110 ohms.
Signal level:	>0.2 – 7Vpp.

Electrical signal outputs:

Type:	Transformer balanced.
Connector:	DB25 female.
Impedance:	110 ohms.

Performance:

Sampling rates:	32 - 96kHz.
Switching mode:	Asynchronous.
Jitter:	Typical 800ps.

[3] GYDA-VX must be applied for SNMP agent if Syscon is used; only Multicon includes SNMP agent.

2.5 Rear view

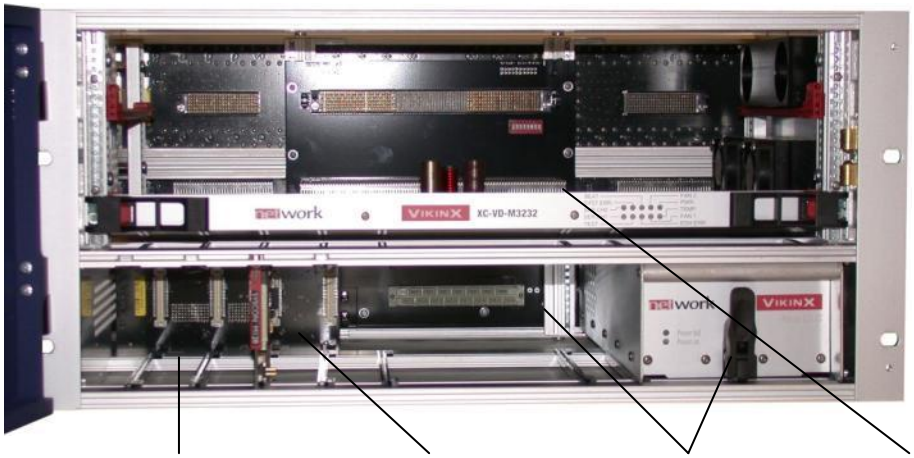
The following service connectors can be found on the rear of the Modular AES/EBU Digital Audio Router:

- **AC Mains A**: AC mains power supply.
- **AC Mains B**: AC mains power supply (if redundant PSU is installed).
- **Serial A1 and A2**: RS-232 or RS-422 for external control protocols.
- **Serial B1 and B2**: RS-232 or RS-422 for external control protocols (if redundant Multicon VX-MOD is installed).
- **Ethernet A**: 10/100Base-T Ethernet bus for external router control.
- **Ethernet B**: 10/100Base-T Ethernet bus for external router control (if redundant Multicon VX-MOD-SM is installed).
- **Serial GYDA A**[4]: RS-232 or RS-422 for external connection to GYDA-VX (if GYDA-VX is installed).
- **Serial GYDA B**[4]: RS-232 or RS-422 for external connection to GYDA-VX (if redundant GYDA-VX is installed).
- **Ethernet GYDA A**[4]: 10/100Base-T Ethernet bus for external connection to GYDA-VX (if GYDA-VX is installed).
- **Ethernet GYDA B**[4]: 10/100Base-T Ethernet bus for external connection to GYDA-VX (if redundant GYDA-VX is installed).
- **VIT 1**[2]: Synchronization signal 1 (in/out). See chapter 2.3 for reference.
- **VIT 2**[2]: Synchronization signal 2 (in/out). See chapter 2.3 for reference.
- **Power Alarm**: Power fail alarm relay contacts. Separate contact pair for each PSU module that is installed. Contact closes on power failure. See Chapter 2.2 for further description.
- **SW 1**: Configuration switch 1 (not in use).
- **SW 2**: Configuration switch 2 (not in use).

[4] Not in use on routers controlled by Multicon VX-MOD.

3 Modules inside the Modular AES/EBU Digital Audio Router

In order to get an overview of the parts that form the Modular AES/EBU Digital Audio Router this chapter will highlight some of the main components.



3.1 How to access the modules

All active modules are accessible through the front of the router frame. If service or inspection is required, open the unit from the front. The door may be removed for easy access to the modules.

An important feature of all the modules in the Modular AES/EBU Digital Audio Router frame is that they are all hot-swappable. The user does not have to turn off the power in order to remove/reinstall/replace a module with active components inside the Modular AES/EBU Digital Audio Router.

> When a board is hot-swapped and the reset button pushed, the router will restore the current setting within seconds.

3.2 How to configure the router and modules

Setting up and configuring the router and its modules is done with the Nevion Configurator software. The Nevion Configurator is shipped with the router, or could be downloaded from http://www.nevion.com.

For further instructions on router configuration, please see the online documentation in the Nevion Configurator.

> When the size of the router is changed by adding or removing of Main X-point modules and/or I/O X-point modules, the Nevion Configurator must be reconfigured to fit to the new router size.

3.3 Power Supply module

Each Modular AES/EBU Digital Audio Router frame comes with either one or two power supply modules. One power supply is standard, dual redundant power supply is an option.

The first power supply module is inserted in the *left* slot (A), and the second is inserted in the *right* slot (B).

[5] GYDA-VX is not applicable in a frame controlled by Multicon VX-MOD.

3.3.1 Module insertion

In order to insert a power supply module one must insert the module via the special plastic guide rails into its position. Once the module is inserted, fix the module by lifting up the handle on the front and pushing it to the upright position.

3.3.2 Module removal

In order to remove a power supply module, one must pull down the handle on the front downwards to a horizontal position, and pull the module out with the bar on top of the power module.

3.3.3 How to connect power to the Modular AES/EBU Digital Audio Router

There are two power connectors on the back of the frame. These connectors are for AC mains connection.

Use an IEC 320 connector to connect AC mains to the Modular AES/EBU Digital Audio Router frame.

> There is a switch on the right hand side of the power supply module that selects mains voltage. The mains voltage can be either 110VAC or 230VAC. This switch must be set in the correct position, depending on the mains voltage on the router's site.
>
> **Failing to select correct AC mains voltage properly may damage the Power Supply Unit.**

If the frame is equipped with a single power supply module, only one AC mains connection is used. However, if the frame is equipped with dual, redundant power supply modules, both AC mains connectors must be used, preferably from two different mains circuits.

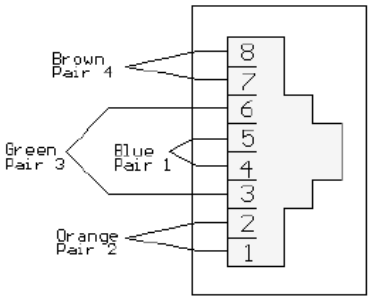
3.3.4 Status LEDs and Relay contacts

There are 2 LEDs on the front of each power supply module, and they indicate the following:

- The upper, RED LED should be normally OFF. If it is ON, there is a power supply failure, indicating that the power supply module must be replaced.
- The lower, GREEN LED must be ON when mains power is connected. If this LED is OFF, it means that there is no mains power supplying the frame.

There are also two Power fail alarm relay contacts on the rear side of the frame; see Chapter 1 for details. Each installed PSU module has a separate pair of contacts. The relay contact is normally open, and the contact closes on power failure.

- The PSU module A alarm is formed by contact between Pin 3 and Pin 6 (Green pair)
- The PSU module B alarm is formed by contact between Pin 1 and Pin 2 (Orange pair)



3.4 System Controller – Multicon VX-MOD

Each VikinX Modular frame comes with either one or two system controller cards, Multicon VX-MOD. One Multicon VX-MOD is necessary to control the router; dual redundant Multicon VX-MOD is an option.

Please see separate Multicon VX-MOD manual for details about configuration and control.

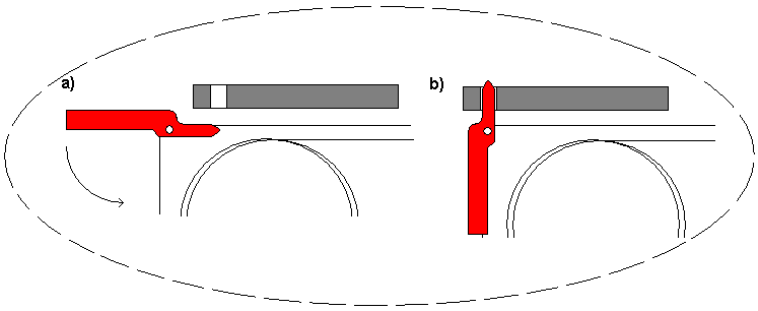
Multicon VX-MOD can be enabled for 3rd party control interfaces. Please contact your Nevion representative for details. Further, Multicon provides the user with an SNMP agent.

Your Multicon VX-MOD card(s) may be inserted in any of the two slots (A) and (B).

All the configuration parameters, control parameters, etc. are stored in the Compact Flash (CF) memory of the Multicon VX-MOD card. This provides a high grade of security for the user, as he just needs to remove the CF card if the Multicon VX-MOD card fails, and install this CF card on a new Multicon VX-MOD card. The router will not notice the difference.

3.4.1 Card insertion

The frame is equipped with plastic guide rails to align the Multicon VX-MOD cards into their respective positions. Slide the card into the plastic guide rails inside the frame until the red handle is close to the frame front. A detailed description of the last part of the insertion process is shown in the figure below.

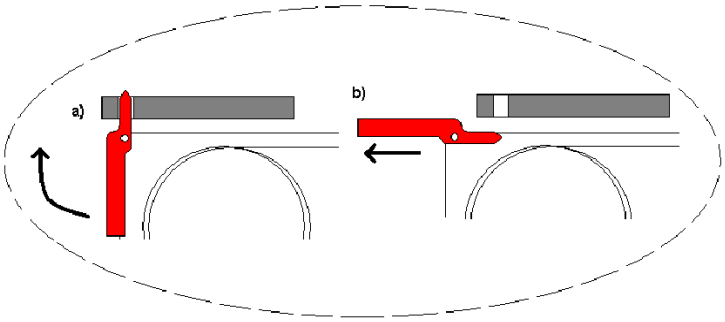


On the top of the card tray, there is a hole above each module slot. When the tip of the handle is just below this hole, start to push the handle downwards as in the figure. The tip of the handle enters the hole and the card is locked and proper contact ensured when the handle is in downright position.

Do not use excessive force; the card should enter easily – proper insertion is almost effortless.

3.4.2 Card removal

To remove a module card from the sub-rack frame, release the card by moving the red handle until it is in horizontal position, as shown in the figure below. Then pull the card out of the sub-rack with the red handle.



3.4.3 Status LEDs and Reset button

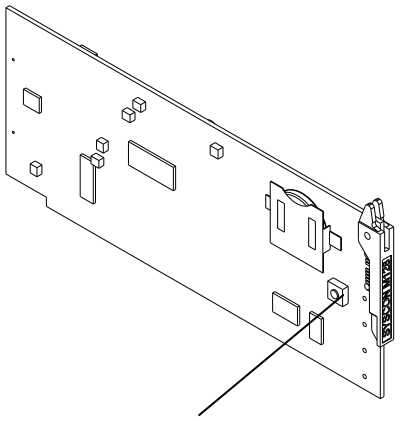
There are 4 LEDs on the front side of the Multicon VX-MOD-SM card, and a reset button on the rear side.

Status LEDs

The LEDs indicate the following:

Diode	Red LED	Yellow LED	Green LED	No light
Status	Card error.	Not applicable.	Overall status of the card is OK	Card has no power, or is not inserted correctly.
Eth	Not applicable.	Full duplex connection.	Half duplex connection.	No Ethernet link established; check cable.
Warn	Abnormal situation: no functional error, but a situation that requires attention. See also chapter 6.	Not applicable.	Normal situation.	Not applicable.
Load	High load[6] on the µController. May occur during system start up and software reconfigurations / -upgrades.	Medium load on the µController.	Low or normal load on the µController.	Not applicable.

[6] Red LED means 100% load on the Multicon. This may occur for intervals up to approximately 20 seconds. Longer periods may indicate that there is something wrong with the Multicon.



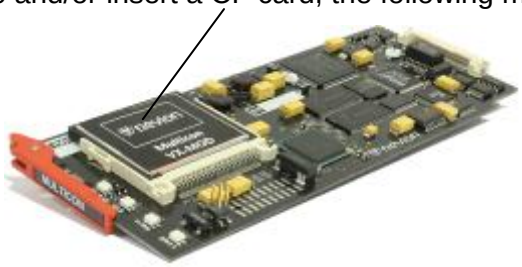
Reset button

The reset button on the rear side is used to perform a hard reset of the card. Do *not* perform a hard reset, unless the situation demands this. By performing a hard reset, the user loses control of the router, and will not get control of the router until approximately 20 seconds after releasing the reset button.

3.4.4 CF-card and battery

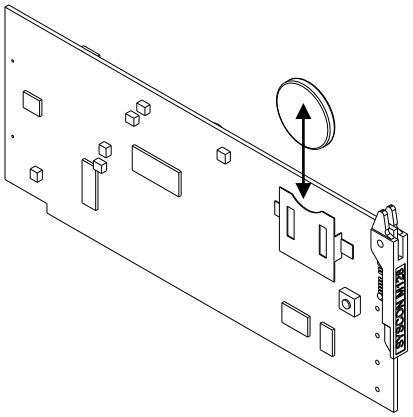
All the information regarding the router configuration, as well as information regarding control panels that are connected to the router, is stored in the Compact Flash card on the Multicon VX-MOD card.

If it is necessary to remove and/or insert a CF card, the following must be done:



1. Remove the Multicon VX-MOD card from its slot, according to the description earlier in this manual.
2. Slide the CF card out of its socket, and insert the new CF card into the socket.
3. Insert the Multicon VX-MOD card into its slot, according to the description earlier in this manual.

If it is necessary to remove and/or insert a battery, the following must be done:



1. Remove the Multicon VX-MOD card from its slot, according to the description earlier in this manual.
2. Slide the battery out of its socket, and insert the new battery into the socket.
3. Insert the Multicon VX-MOD card into its slot, according to the description earlier in this manual.

3.5 X-point module

Each VikinX Modular frame must be equipped with at least one X point card, in order to work as a router.

A maximum of two X point cards can be inserted into the frame, providing router sizes of either 64x64 stereo audio or 128x128 stereo audio. *The X-point cards are inserted according to the labelling on the rear side of the frame.*

3.5.1 Card insertion

To insert an X-point card, slide the module along the plastic guide rails into its position. On both sides of the card tray there is a hole next to each module slot. Use the two handles, which are located on the front of the module to seat the module.

When the tip of both handles is just next to these holes, start to push the handles ***simultaneously*** inwards the card.

The tip of the handles enters the hole and the card is locked and proper contact ensured when you hear a click from ***both*** handles.

> Note that it may be necessary to press hard when inserting the X-point card(s). Be sure to press the card(s) firmly into the frame, before locking the handles.

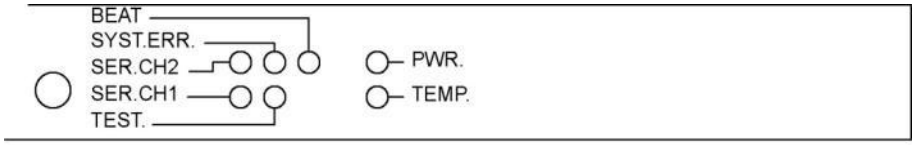
3.5.2 Card removal

To remove an X-point card from the frame, release the card by pushing the red knobs on each handle until each handle releases from its locked position.

Then pull both handles simultaneously, and pull the card out of the frame.

3.5.3 Status LEDs

There are 7 LEDs on the front of each Digital Audio X point card:



They indicate the following:

Diode	Red LED	Green LED
BEAT		Blinks when the µController is running (heartbeat).
SYST.ERR	A fault is detected on the card. The system controller lights, or turns off this LED. This is used for simplifying the identification of a module.	
SER.CH2		Blinks each time the µController of the X point card answers a message from the system controller on communication channel 2.
SER.CH1		Blinks each time the µController of the X point card answers a message from the system controller on communication channel 1.
TEST	No special function; for internal testing purpose only.	
PWR	Any of the voltages on the card is outside their legal range.	All internal voltages are OK.

Diode	Red LED	Green LED
TEMP	The temperature of the card is outside its legal range.	The temperature of the card is OK.

Note that all alarm ranges are configurable from the system controller.

3.5.4 Service switches and Reset button

There are two slide-switches and one push-button switch on the card, as shown in the figure below.

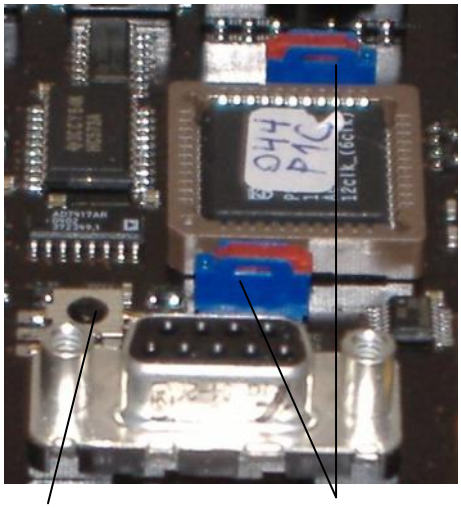


Figure 1

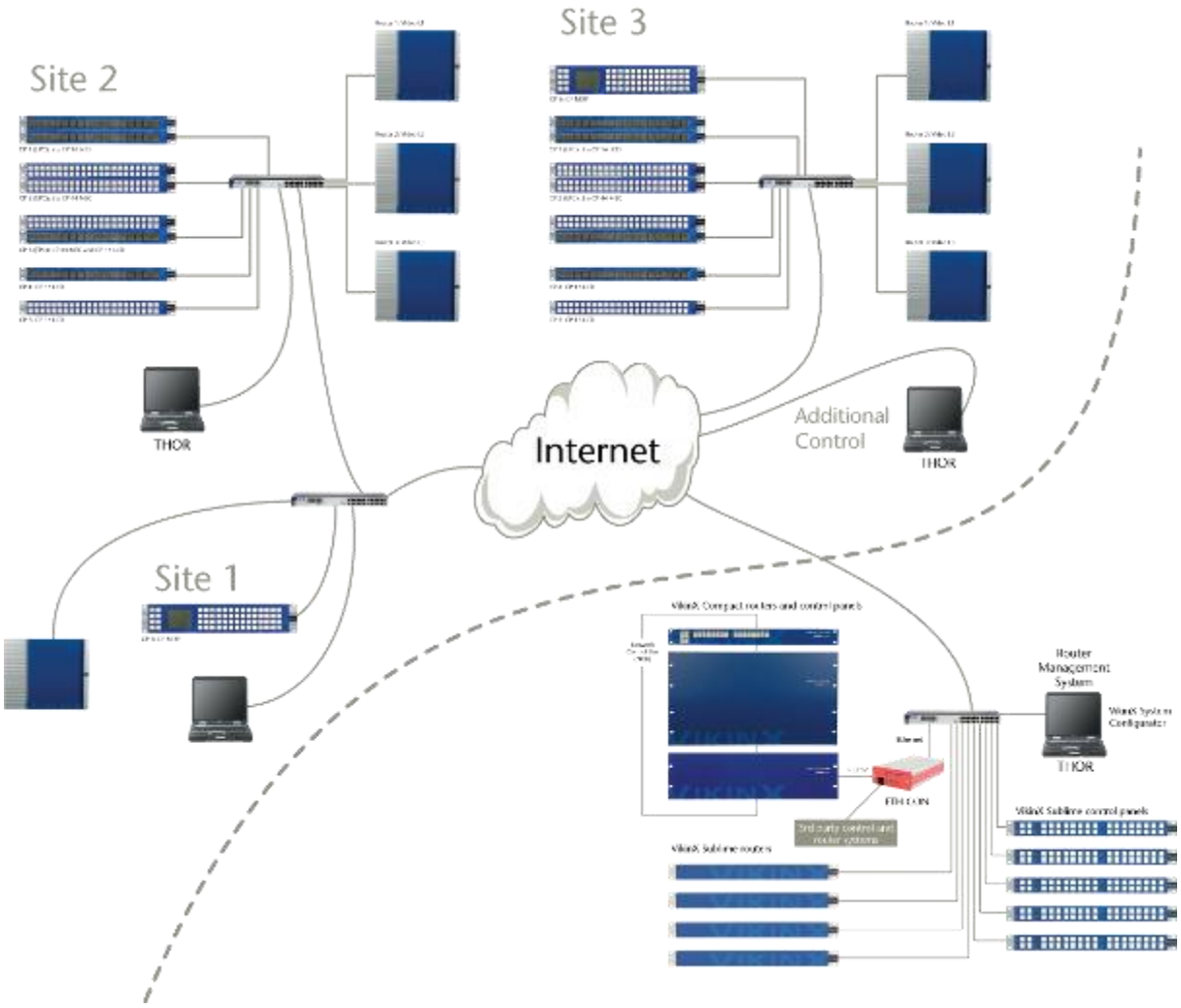
The push-button switch is the RESET switch. When this button is pushed and released, the µController of the X point card resets and restarts its operation with its default settings, or the settings stored in EEPROM.

The slide switch closest to the front of the X point card (SW2): *This switch must always stay in the right position, as seen from the card front.* **The switch is for factory use only.**

The slide switch furthest from the front of the X point card (SW4): *This switch must always be in the left position, as seen from the card front.* **The switch is for factory use only.**

4 Router communication

You gain access to router for communication purposes by connecting either the router's serial port to your computer and/or by using an Ethernet connection.



Please refer to the manual for Multicon VX-MOD for a detailed description of the applicable communication interfaces for your modular router.

5 Connecting signal cables to the router

Below you will find our standard pin-out for DB25 audio contacts. This pin-out is used for both Analog and digital audio routers. The same standard is used by Tascam and Fostex.

Channel #	DB25 Pin #		
	Hot (+)	Cold (-)	GND
1	24	12	25
2	10	23	11
3	21	9	22
4	7	20	8
5	18	6	19
6	4	17	5
7	15	3	16
8	1	14	2

All audio contacts used on the routers are female type.

The DB25 connectors on the rear of each unit are arranged as follows:

Input section			Output section		
105-112	113-120	121-128	105-112	113-120	121-128
		97-104	97-104		
		89-96	89-96		
65-72	73-80	81-88	65-72	73-80	81-88
		57-64	57-64		
		49-56	49-56		
25-32	33-40	41-48	25-32	33-40	41-48
1-8	9-16	17-24	1-8	9-16	17-24

6 Before calling Nevion Support

The following table shows possible symptoms, and what to do in order to correct possible error sources. Every user should read this before calling Nevion Technical Support.

Symptom	What to do…
The lower, GREEN LED on the Power Supply is OFF.	No mains or battery power supplying the frame. Check that the power supply is connected properly. This includes check of all connected power cords, etc.
The upper, RED LED on the Power Supply is ON.	There is a power supply failure, indicating that the power supply module must be replaced.
The Status LED on the Multicon VX-MOD card is RED.	There is a card error, indicating that the Multicon VX-MOD card must be replaced.
The Warn LED on the Multicon VX-MOD card is RED.	An abnormal situation has occurred. See Chapter 2. If the router has redundant PSU modules, check that both modules are properly installed, and are working. If the router has redundant Multicon VX-MOD cards, check that both cards are properly inserted, and are working.
The SYST.ERR. LED on one of the X-point cards is RED.	A fault is detected on the X-point card. Check that it is properly connected. If it is properly connected, the X-point card needs replacement.
The PWR. LED on one of the X-point cards is RED.	Any of the voltages on the card is outside its legal range, indicating that service in necessary.
The TEMP. LED on one of the X-point cards is RED.	Any of the temperatures on the card is outside its legal range, indicating that service is necessary.

7 Serial number overview

The following table shows the serial numbers of all parts of your Modular AES/EBU Digital Audio Router. Please refer to these numbers when contacting Nevion for product support.

Device / Part	Part / Serial number
Frame, including all static cards	
Power Supply Module #1	
Power Supply Module #2, if included	
X-point Card #1	
X-point Card #2, if included	
Multicon VX-MOD Card #1	
Multicon VX-MOD Card #2, if included	
Syscon Card #1[7]	
Syscon Card #2[7], if included	
GYDA-VX Card #1[7], if included	
GYDA-VX Card #2[7], if included	

[7] Only if Multicon is not applied.

General environmental requirements for Nevion equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
   - Operating room temperature range: 0°C to 45°C
   - Operating relative humidity range: <95% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
   - Temperature range: -10°C to 55°C
   - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.com

Important notes regarding Software in the VikinX Modular router family range

This product utilises software components that are licensed with open source licenses. The source code for these components and our modifications are available from: http://labs.nevion.com/open-source/.

You may also send Nevion a recordable CD and a self-addressed envelope, and we will burn the contents of http://labs.nevion.com/open-source/ to your CD and send it back to you.

This offer is valid for 3 years after purchase of this product.

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the “Administrative Measure on the Control of Pollution by Electronic Information Products”. In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
FR-128128-AD	O	O	O	O	O	O
XC-AD-M6464	X	O	O	O	O	O
Multicon VX-MOD	O	O	O	O	O	O
GYDA-VX (option)	O	O	O	O	O	O
POWER-SM	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

Parts without any of the above mentioned hazardous substances are indicated by the product marking:

A.2 Environmentally-friendly use period

The manual must include a statement of the “environmentally friendly use period”. This is defined as the period of normal use before any hazardous material is released to the environment. The guidance on how the EFUP is to be calculated is not finalised at the time of writing. See http://www.aeanet.org/GovernmentAffairs/qfLeOpAaZXaMxqGjSFbEidSdPNtpT.pdf for an unofficial translation of the draft guidance. For our own products, Nevion has chosen to use the *50 year figure* recommended in this draft regulation.

Nevion suggests the following statement on An “Environmentally Friendly Use Period” (EFUP) setting out normal use:

> **EFUP is the time the product can be used in normal service life without leaking the hazardous materials. We expect the normal use environment to be in an equipment room at controlled temperature range (0ºC - 40ºC) with moderate humidity (< 90%, non-condensing) and clean air, not subject to vibration or shock.**

Further, a statement on any hazardous material content, for instance, for a product that uses some tin/lead solders:

Where a product contains potentially hazardous materials, this is indicated on the product by the appropriate symbol containing the EFUP. The hazardous material content is limited to lead (Pb) in some solders. This is extremely stable in normal use and the EFUP is taken as 50 years, by comparison with the EFUP given for Digital Exchange/Switching Platform in equipment in Appendix A of "General Rule of Environment-Friendly Use Period of Electronic Information Products". This is indicated by the product marking:

It is assumed that while the product is in normal use, any batteries associated with real-time clocks or battery-backed RAM will be replaced at the regular intervals.

The EFUP relates only to the environmental impact of the product in normal use, it does not imply that the product will continue to be supported for 50 years.

A.3 Recycling information

Nevion provides assistance to customers and recyclers through our web site http://www.nevion.com/. Please contact Nevion's Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Nevion or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labelled to show their material content.
- Depending on the date of manufacture, this product may contain lead in solder.
- Some circuit boards may contain battery-backed memory devices.

EC Declaration of Conformity

MANUFACTURER	Nevion Europe AS P.O. Box 1020, 3204 Sandefjord, Norway	
AUTHORIZED REPRESENTATIVE (Established within the EEA)	Not applicable	
MODEL NUMBER(S)	AD6464M / AD128128M	
DESCRIPTION	Modular AES/EBU Digital Audio Router	
DIRECTIVES this equipment complies with	Low voltage (EU Directive 2006/95/EC) EMC (EU Directive 2004/108/EC) RoHS (EU Directive 2002/95/EC) China RoHS[8] WEEE (EU Directive 2002/96/EC) REACH	
HARMONISED STANDARDS applied in order to verify compliance with Directive(s)	EN 55103-1:1996 EN 55103-2:1996	
TEST REPORTS ISSUED BY	**Notified/Competent Body**	**Report no:**
	Nemko	10690
TECHNICAL CONSTRUCTION FILE NO	Not applicable	
YEAR WHICH THE CE-MARK WAS AFFIXED	2003	
TEST AUTHORIZED SIGNATORY		
MANUFACTURER	**AUTHORIZED REPRESENTATIVE (Established within EEA)**	**Date of Issue**
		2011-01-20
		Place of Issue
	Not applicable	Sandefjord, Norway

NEVION EUROPE AS
O.nr. 976 584 201 MVA

Name Thomas Øhrbom

Position QA Director, Nevion Europe (authorized signature)

[8] Administration on the Control of Pollution Caused by Electronic Information Products